

APPENDIX A

Remedial Alternatives Cost Tables

Table A-1
Alternative #2
Excavation and Disposal of All COC-Impacted Soil
Demolition and Disposal of PCB-Impacted Concrete
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Item No.	Direct Capital Costs				
1	Mobilization/Demobilization	1	ls	\$ 20,000	\$ 20,000
2	Excavation Shoring	110,500	sqft	\$ 33	\$ 3,646,500
PCBs					
3	Excavate/Stockpile/Load	1,412	cy	\$ 8	\$ 11,296
4a	Transport and Dispose (PCB-Impacted Non-TSCA)	1,906	ton	\$ 60	\$ 114,375
4b	Transport and Dispose (TSCA >50, < 1000 mg/kg)	106	ton	\$ 100	\$ 10,590
4c	Transport and Dispose (TSCA > 1000 mg/kg)	106	ton	\$ 272	\$ 28,806
Metals					
5	Excavate/Stockpile/Load	70	cy	\$ 8	\$ 563
6a	Transport and Dispose - Non-Hazardous	95	ton	\$ 32	\$ 3,040
6b	Transport and Dispose Non-RCRA CA Hazardous	11	ton	\$ 81	\$ 855
VOCs and Stoddard Solvent					
7	Excavate/Stockpile/Load	155,201	cy	\$ 8	\$ 1,241,611
8a	Transport and Dispose Non-Hazardous	209,522	ton	\$ 56	\$ 11,733,226
8b	Transport and Dispose RCRA-Hazardous	23,280	ton	\$ 127	\$ 2,956,587
9	Stockpile and Confirmation Sampling	783	ea	\$ 250	\$ 195,855
10	Purchase and Import Fill	50,000	ton	\$ 8	\$ 400,000
11	Place and Compact Fill	40,000	ton	\$ 8.25	\$ 330,000
PCB-Impacted Concrete					
12	Concrete Removal/Stockpile/Load (>5.3 mg/kg but <50 mg/kg)	3,723	ft^3	\$ 1	\$ 3,723
13	Concrete Removal/Stockpile/Load (>50 mg/kg)	1,406	ft^3	\$ 1	\$ 1,406
14	Stockpile and Confirmation Sampling	5	ea	\$ 250	\$ 1,282
15	Transport and Dispose (PCB-Impacted Non-TSCA)	279	ton	\$ 60	\$ 16,754
16	Transport and Dispose (PCB-Impacted TSCA)	105	ton	\$ 100	\$ 10,545
Other					
17	Site Grading	1.5	acre	\$ 5,000	\$ 7,500
18	Air Monitoring	1	ls	\$ 20,000	\$ 20,000
19	Health and Safety	1	ls	\$ 20,000	\$ 20,000
20	Other Non-Scheduled Contract Work	1	ls	\$ 20,000	\$ 20,000
Direct Capital Total					\$ 20,795,000
Item No.	Indirect Capital Costs				
1	Construction Management	6%	of	\$ 20,795,000	\$ 1,247,700
Indirect Capital Subtotal					\$ 1,248,000
Direct + Indirect Cost					\$ 22,043,000
Bid Contingency (15% estimated contractor costs)					\$ 3,306,000
Scope Contingency (15% estimated contractor costs)					\$ 3,306,000
Contingencies					\$ 6,612,000
Capital Total					\$ 28,700,000

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Alternative #2
Excavation and Disposal of All COC-Impacted Soil
Demolition and Disposal of PCB-Impacted Concrete
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

NOTES/ASSUMPTIONS

1. Excavation costs include AQMD Rule 1166 Monitoring.
2. Excavation shoring cost only includes areas proposed to be excavated at depths of 10 feet bgs or greater.
3. Soil stockpile confirmation sampling rate at one sample per 200 cy; concrete confirmation sampling rate at one sample per 1,000 ft³.
4. Backfill to be comprised on crushed recycled aggregate obtained from on-site demolition and crushing of former concrete structures. Unit cost for placement and compaction also includes crushing. Additional Purchase and Import Fill includes compaction
5. Excavation and disposal at a rate of 500 cy per day.
6. 90% of PCB-impacted soil excavated will be disposed of as Non-TSCA < 50 mg/kg, 5% of PCB-impacted soil excavated will be disposed of as TSCA > 50, < 1,000 mg/kg, 5% of PCB-impacted soil excavated will be disposed of as TSCA > 1,000 mg/kg.
7. 90% of Metals-impacted soil excavated will be disposed of as Non-Hazardous,
10% of Metals-impacted soil excavated will be disposed of as RCRA-Hazardous.
8. 90% of VOC-impacted soil excavated will be disposed of as Non-Hazardous,
10% of VOC-impacted soil excavated will be disposed of as RCRA-Hazardous.
9. Soil Conversion Factor: 1.5 tons/cy.
10. Average concrete slab thickness is 12 inches.
11. Density of Concrete is 150 lbs/ft³.
12. No cost included for institutional controls such as deed restrictions which will include legal and administrative fees.
13. No cost included for engineering controls such as future vapor barrier requirements.
14. Bid and Scope contingencies derived from "A Guide to Developing and Documenting Remedial Alternative Cost Estimates During the FS," EPA, 2000.
15. ls = lump sum price.
16. sqft = square feet.
17. cy = cubic yard.
18. ea = each.

Table A-2
Alternative #3



**Excavation and Disposal of Shallow COC-Impacted Soil
SVE for Shallow and Deep VOC and Stoddard Solvent-Impacted Soil
Demolition and Disposal of PCB-Impacted Concrete**
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Direct Capital Costs					
1	Mobilization/Demobilization	1	ls	\$ 5,000	\$ 5,000
2	Excavation Shoring	2,900	sqft	\$ 33	\$ 95,700
PCBs					
3	Excavate/Stockpile/Load	1,412	cy	\$ 8	\$ 11,296
4a	Transport and Dispose (Non-TSCA < 50 mg/kg)	1,906	ton	\$ 60	\$ 114,375
4b	Transport and Dispose (TSCA >50, < 1000 mg/kg)	106	ton	\$ 100	\$ 10,590
4c	Transport and Dispose (TSCA > 1000 mg/kg)	106	ton	\$ 272	\$ 28,806
Metals					
5	Excavate/Stockpile/Load	70	cy	\$ 8	\$ 563
6a	Transport and Dispose - Non-Hazardous	95	ton	\$ 32	\$ 3,040
6b	In Situ Stabilization	11	ton	\$ 81	\$ 855
PCB-Impacted Concrete					
7	Concrete Removal/Stockpile/Load (>5.3 mg/kg but <50 mg/kg)	3,723	ft^3	\$ 1	\$ 3,723
8	Concrete Removal/Stockpile/Load (>50 mg/kg)	1,406	ft^3	\$ 1	\$ 1,406
9	Stockpile and Confirmation Sampling	5	ea	\$ 250	\$ 1,282
10	Transport and Dispose (PCB-Impacted Non-TSCA)	279	ton	\$ 60	\$ 16,754
11	Transport and Dispose (PCB-Impacted TSCA)	105	ton	\$ 100	\$ 10,545
VOCs SVE					
10	Site Preparation	1	ls	\$ 5,000	\$ 5,000
11	SVE Well and Probe Installation	23	ea	\$ 6,000	\$ 138,000
12	Well Head Completion, Valves, Surface Seal	23	ea	\$ 1,000	\$ 23,000
13	Treatment System Manifold, Valves, Controls	1	ls	\$ 6,000	\$ 6,000
14	Auto-Dialer Control and Instrumentation	1	ls	\$ 5,000	\$ 5,000
15	Vapor-Phase GAC Vessels ¹⁴	1	ls	\$ 18,000	\$ 18,000
16	Electrical Panel/Supply	1	ls	\$ 15,000	\$ 15,000
17	Temporary Hose and Piping	2000	lf	\$ 10	\$ 20,000
18	Compound Gravel Pad, Fence Installation, Gates	1	ea	\$ 8,000	\$ 8,000
19	Treatment System Installation and Start-Up	1	ls	\$ 20,000	\$ 20,000
20	Laboratory Analysis	1	ls	\$ 10,000	\$ 10,000
21	Health and Safety	1	ls	\$ 10,000	\$ 10,000
22	System Decommission	1	ls	\$ 50,000	\$ 50,000
23	Other Non-Scheduled Contract Work	1	ls	\$ 10,000	\$ 10,000
Stoddard Solvent SVE					
24	Mobilization/Demobilization	1	ls	\$ 10,000	\$ 10,000
25	Site Preparation	1	ls	\$ 5,000	\$ 5,000
26	BioVent Well and Probe Installation	19	ea	\$ 6,000	\$ 114,000
27	Well Head Completion, Valves, Surface Seal	19	ea	\$ 1,000	\$ 19,000
28	Treatment System Manifold, Valves, Controls	1	ls	\$ 6,000	\$ 6,000
29	Auto-Dialer Control and Instrumentation	1	ls	\$ 5,000	\$ 5,000
30	Vapor-Phase GAC Vessels	1	ls	\$ 18,000	\$ 18,000
31	Electrical Panel/Supply	1	ls	\$ 50,000	\$ 50,000
32	Below-Grade Piping	2,250	lf	\$ 30	\$ 67,500
33	Compound Pad, Fence Installation, Gates	1	ea	\$ 8,000	\$ 8,000
34	Treatment System Installation and Start-Up	1	ls	\$ 20,000	\$ 20,000
35	Laboratory Analysis	1	ls	\$ 10,000	\$ 10,000
36	Health and Safety	1	ls	\$ 10,000	\$ 10,000
37	System Decommission	1	ls	\$ 50,000	\$ 50,000
38	Other Non-Scheduled Contract Work	1	ls	\$ 10,000	\$ 10,000
Direct Capital Total					\$ 1,044,000

Table A-2
Alternative #3



**Excavation and Disposal of Shallow COC-Impacted Soil
SVE for Shallow and Deep VOC and Stoddard Solvent-Impacted Soil
Demolition and Disposal of PCB-Impacted Concrete**
Former Pechiney Cast Plate, Inc., Facility
Vernon, California

Item No.	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Indirect Capital Costs					
1	Permitting AQMD	5%	of	\$ 338,750	\$ 16,938
2	System Design	10%	of	\$ 695,000	\$ 69,500
3	Construction Management	6%	of	\$ 1,044,000	\$ 62,640
Indirect Capital Subtotal					\$ 63,000
Direct + Indirect Cost					\$ 1,107,000
Bid Contingency (15% estimated contractor costs)					\$ 166,000
Scope Contingency (15% estimated contractor costs)					\$ 166,000
Contingencies					\$ 332,000
Capital Total					\$ 1,439,000
Item	Description	Estimated	Unit	Unit Cost	Estimated Cost
VOCs and Stoddard Solvent SVE Annual Operation and Maintenance					
1	Equipment Rental	24	mths	\$ 5,000	120,000
2	Operations & Maintenance	24	mths	\$ 8,000	\$ 192,000
3	Carbon Changeouts	32	ea	\$ 3,000	\$ 96,000
4	Electrical Fees	24	mths	\$ 2,000	\$ 48,000
5	Sampling & Analysis	24	mths	\$ 2,000	\$ 48,000
6	Production Water Disposal	24	mths	\$ 4,000	\$ 96,000
7	Project Management/Consultant support/Reports	24	mths	\$ 4,000	\$ 96,000
8	Health & Safety/Air Monitoring	24	mths	\$ 1,000	\$ 24,000
9	Miscellaneous	24	mths	\$ 2,000	\$ 48,000
Annual Operation and Maintenance Subtotal					\$ 768,000
Present Worth Factor (5%, 3 years)					2.72
Present Worth of Operation and Maintenance					\$ 2,091,000
TOTAL CONSTRUCTION PLUS O&M FOR 3 YEARS					\$ 3,500,000

NOTES/ASSUMPTIONS

- Excavation costs include AQMD Rule 1166 Monitoring.
- Excavation shoring cost only includes areas proposed to be excavated at depths of 10 feet bgs or greater.
- Soil stockpile confirmation sampling rate at one sample per 200 cy; concrete confirmation sampling rate at one sample per 1,000 ft³.
- Import Fill to be comprised on crushed recycled aggregate obtained from on-site demolition and crushing of former concrete structures. Unit cost for placement and compaction also includes crushing.
- Excavation and disposal at a rate of 500 cy per day.
- 90% of PCB-impacted soil excavated will be disposed of as Non-TSCA < 50 mg/kg, 5% of PCB-impacted soil excavated will be disposed of as TSCA > 50, < 1,000 mg/kg, 5% of PCB-impacted soil excavated will be disposed of as TSCA > 1,000 mg/kg.
- 90% of Metals-impacted soil excavated will be disposed of as Non-Hazardous, 10% of Metals-impacted soil excavated will be disposed of as RCRA-Hazardous.
- 90% of VOC-impacted soil excavated will be disposed of as Non-Hazardous, 10% of VOC-impacted soil excavated will be disposed of as RCRA-Hazardous.
- Soil Conversion Factor: 1.5 tons/cy.
- Average concrete slab thickness is 12 inches.
- Assume 500 SCFM for SVE system.
- Total system operation for a period of one year; for purposes of cost estimation, assumes system run time of three years.
- SVE = Soil Vapor Extraction.
- Dual 1,000 pound vapor phase granular activated carbon (GAC) vessels for SVE system.
- AQMD = Air Quality Management District.
- No cost included for institutional controls such as deed restrictions which will include legal and administrative fees.
- No cost included for engineering controls such as future vapor barrier requirements.
- Bid and Scope contingencies derived from "A Guide to Developing and Documenting Remedial Alternative Cost Estimates During the FS," EPA, 2000.
- ls = lump sum price.
- sqft = square feet.
- cy = cubic yard.
- ea = each.
- lf = linear feet.
- mths = months.

Table A-3
Alternative #4
In Situ Stabilization of Shallow PCB/Metals/Stoddard Solvent-Impacted Soil
SVE for Shallow and Deep VOC-Impacted Soil
Demolition and Disposal of PCB-Impacted Concrete
 Former Pechiney Cast Plate, Inc., Facility
 Vernon, California

	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Item No.	Direct Capital Costs				
PCB, Metals, and Stoddard Solvent Stabilization					
1	Mobilization/Demobilization	1	ls	\$ 100,000	\$ 100,000
2	Site Preparation	1	ls	\$ 10,000	\$ 10,000
3	In Situ Stabilization	47,841	cy	\$ 120	\$ 5,740,933
4	Confirmation Sampling	239	ea	\$ 250	\$ 59,801
5	Air Monitoring	1	ls	\$ 15,000	\$ 15,000
6	Excess Cuttings Disposal	14,352	ton	\$ 61	\$ 875,492
7	Health and Safety	1	ls	\$ 10,000	\$ 10,000
8	Other Non-Scheduled Contract Work	1	ls	\$ 50,000	\$ 50,000
PCB-Impacted Concrete					
9	Concrete Removal/Stockpile/Load (>5.3 mg/kg but <50 mg/kg)	3,723	ft^3	\$ 1	\$ 3,723
10	Concrete Removal/Stockpile/Load (>50 mg/kg)	1,406	ft^3	\$ 1	\$ 1,406
11	Stockpile and Confirmation Sampling	5	ea	\$ 250	\$ 1,282
12	Transport and Dispose (>5.3 mg/kg but <50 mg/kg)	279	ton	\$ 60	\$ 16,754
13	Transport and Dispose (>50 mg/kg)	105	ton	\$ 100	\$ 10,545
VOCs SVE					
14	Site Preparation	1	ls	\$ 5,000	\$ 5,000
15	SVE Well and Probe Installation	23	ea	\$ 6,000	\$ 138,000
16	Well Head Completion, Valves, Surface Seal	23	ea	\$ 1,000	\$ 23,000
17	Treatment System Manifold, Valves, Controls	1	ls	\$ 6,000	\$ 6,000
18	Auto-Dialer Control and Instrumentation	1	ls	\$ 5,000	\$ 5,000
19	Vapor-Phase GAC Vessels	1	ls	\$ 18,000	\$ 18,000
20	Electrical Panel/Supply	1	ls	\$ 15,000	\$ 15,000
21	Temporary Hose and Piping	2000	lf	\$ 10	\$ 20,000
22	Compound Gravel Pad, Fence Installation, Gates	1	ea	\$ 8,000	\$ 8,000
23	Treatment System Installation and Start-Up	1	ls	\$ 20,000	\$ 20,000
24	Laboratory Analysis	1	ls	\$ 10,000	\$ 10,000
25	Health and Safety	1	ls	\$ 10,000	\$ 10,000
26	System Decommission	1	ls	\$ 50,000	\$ 50,000
27	Other Non-Scheduled Contract Work	1	ls	\$ 10,000	\$ 10,000
Direct Capital Total					\$ 7,233,000
Item No.	Indirect Capital Costs				
1	Permitting AQMD	5%	of	\$ 7,233,000	\$ 361,650
2	System Design	10%	of	\$ 7,233,000	\$ 723,300
3	Construction Management	6%	of	\$ 7,233,000	\$ 433,980
Indirect Capital Subtotal					\$ 1,519,000
Direct + Indirect Cost					\$ 8,752,000
Bid Contingency (15% estimated contractor costs)					\$ 1,313,000
Scope Contingency (15% estimated contractor costs)					\$ 1,313,000
Contingencies					\$ 2,626,000
Capital Total					\$ 11,378,000

Table A-3
Alternative #4
In Situ Stabilization of Shallow PCB/Metals/Stoddard Solvent-Impacted Soil
SVE for Shallow and Deep VOC-Impacted Soil
Demolition and Disposal of PCB-Impacted Concrete
 Former Pechiney Cast Plate, Inc., Facility
 Vernon, California

	Description	Estimated Quantity	Unit	Unit Cost	Estimated Cost
Item	Description	Estimated	Unit	Unit Cost	Estimated Cost
Annual Operation and Maintenance					
1	Equipment Rental	12	mths	\$ 5,000	\$ 60,000
2	Operations & Maintenance	12	mths	\$ 8,000	\$ 96,000
3	Carbon Changeouts	16	ea	\$ 3,000	\$ 48,000
4	Electrical Fees	12	mths	\$ 2,000	\$ 24,000
5	Sampling & Analysis	12	mths	\$ 2,000	\$ 24,000
6	Production Water Disposal	12	mths	\$ 4,000	\$ 48,000
7	Project Management/Consultant support/Reports	12	mths	\$ 4,000	\$ 48,000
8	Health & Safety/Air Monitoring	12	mths	\$ 1,000	\$ 12,000
9	Miscellaneous	12	mths	\$ 2,000	\$ 24,000
Annual Operation and Maintenance Subtotal					\$ 384,000
Present Worth Factor (5%, 3 years)					2.72
Present Worth of Operation and Maintenance					\$ 1,046,000
TOTAL CONSTRUCTION PLUS O&M FOR 3 YEARS					\$ 12,400,000

NOTES/ASSUMPTIONS

1. MOB includes Crawler-mounted large diameter augers.
2. Assume ~ 10 percent cement additive. Actual mix design would be performed during Design with necessary cement percentage based on leachability.
3. Stockpile confirmation sampling rate at one sample per 200 cubic yards.
4. Stabilization rate of 300 cubic yards per day.
5. No cost included for institutional controls such as deed restrictions which will include legal and administrative fees.
6. No cost included for engineering controls such as future vapor barrier requirements.
7. Cost assumes 20 percent of mixed volume requires off-site disposal.
8. Assume 300 SCFM for SVE system.
9. Total system operation for a period of one year; for purposes of cost estimation, assumes system run time of three years.
10. SVE = Soil Vapor Extraction.
11. Dual 1,000 pound vapor phase granular activated carbon (GAC) vessels for SVE system.
12. AQMD = Air Quality Management District.
13. Soil Conversion Factor: 1.5 tons/cy.
14. Average concrete slab thickness is 12 inches.
15. Density of Concrete is 150 lbs/ft³.
16. No cost included for institutional controls such as deed restrictions which will include legal and administrative fees.
17. No cost included for engineering controls such as future vapor barrier requirements.
18. Bid and Scope contingencies derived from "A Guide to Developing and Documenting Remedial Alternative Cost Estimates During the FS," EPA, 2000.
19. Is = lump sum price.
20. cy = cubic yard.
21. ea = each.
22. If = linear feet.
23. mths = months.